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THE ENVIRONMENT FUND AND ADMINISTRATIVE AND OTHER BUDGETARY MATTERS

The Mercure satellite communications system

Report by the Executive Director

Summary

Prepared in accordance with Governing Council decision 18/47, this report examines the status of implementation of the Mercure project. The Mercure system is essentially ready to commence operations: identification of host countries, negotiation of agreements, installation of hardware and training of national personnel are approaching completion, and are being carried out at a lower cost than was projected at the eighteenth session of the Governing Council. However, the final step towards full operation has been stalled primarily by a delay in receiving the requisite authorization required by the International Telecommunications Satellite Organization (INTELSAT) for UNEP central earth stations to start using satellite capacity. Without this authorization, the pivotal earth stations situated at UNEP headquarters remain inoperative, and the Mercure system cannot function at any level.

In the meantime, planning by UNEP is well advanced for the enhanced utilization of Internet mechanisms for environmental information access and exchange. These mechanisms are broadly grouped under the "UNEPnet" system and are integral to the underlying Mercure telecommunications capability which will efficiently and effectively support the Environment Programme's activities, particularly in developing countries. This report suggests that, at the currently anticipated levels of future funding, it will be necessary to establish with donor countries a jointly funded project to ensure future UNEPnet/Mercure operation and maintenance.

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Suggested action by the Governing Council

Recalling its decision 17/38, paragraph 7, by which it approved the Executive Director's proposal to finalize an agreement with the participants in the Mercure project,

Recalling also its decision 18/47, by paragraph 8 of which it authorized the expenditure of funds from the management and administrative support costs budget and the programme budget to implement, manage, and maintain the system,

The Governing Council may wish to:

1. Take note of the report of the Executive Director;

2. Express once again its gratitude to the donors for their generous contribution to the initial Mercure configuration, which will facilitate access by the United Nations Environment Programme and its partners to services available through the emerging information highways, and will allow the United Nations Environment Programme to fulfil its mandate for the delivery of environmental data in a more timely, cost-effective and efficient manner;

3. Express its grave concern that the Government of the Republic of Kenya has not yet authorized the submission of the necessary documentation to the International Telecommunications Satellite Organization authorities to enable the United Nations Environment Programme to initiate operation of this advanced system, which would greatly enhance the timely exchange of environmental data and information on a world-wide basis;

4. Express its gratitude to the host countries of the Mercure stations for their willingness to participate in the project and to operate the earth stations;

5. Encourage further extension of this initial project to new countries and users by seeking additional funding from other sources potentially available to the Programme;

6. Encourage the Executive Director to seek to minimize operational Mercure costs in the United Nations offices in Nairobi through efficient management by the United Nations Environment Programme and through integration with the United Nations telecommunication system as soon as possible, in order to avoid unnecessary duplication and to reap the benefit of shared operational costs;

7. Encourage the United Nations Environment Programme to make the UNEPnet/Mercure system available for utilization by the United Nations telecommunication system at other sites where technically and economically feasible;

8. Encourage the United Nations Environment Programme to work with other organizations in the United Nations system that could benefit from the utilization of Mercure to attain their programmatic objectives through formal memoranda of understanding and appropriate cost-sharing relationships;

9. Authorize the Executive Director to establish a co-funded effort, in collaboration with one of the partner organizations of the United Nations Environment Programme, for the continued implementation, operation, and exploitation of UNEPnet/Mercure;

10. Authorize the Executive Director to engage in collaborative programmes with other donors to provide for the continuing development of the UNEPnet infrastructure through a collaboration co-funded by the United Nations Environment Programme and other donors;

11. Request the Executive Director, once the Mercure system is fully operational, to ensure that a full review and cost-benefit analysis of the system and the experience gained in its initial operation is carried out and to submit a report thereon to the Governing Council at its next session;

12. Encourage countries with environmental data and information assets of value for environmental monitoring and management to provide for all countries, particularly developing countries, ease of access and delivery through this initiative of the United Nations Environment Programme.

BACKGROUND

A. Background to the Mercure project

1. By its decision 18/47, paragraph 6, the Governing Council, requested the Executive Director to present to the Governing Council, at its nineteenth session, a status report on the Mercure system, if a full review and cost-benefit analysis of the system and the experience gained in its initial operation was not technically feasible by that time.

2. The satellite-based telecommunications system known as Mercure was conceptually defined in the early 1990s as a high-capacity means of delivering of environmental data and information in support of UNEP programmatic elements, particularly the Global Resources Information Database (GRID). The concept has since been revised to assure global connectivity to partner countries through "UNEPnet", a dedicated part of the Internet for the transmission of environmental data.

3. The original Mercure design concept called for 16 earth stations utilizing existing INTELSAT satellites. The earth stations were designed to include eight higher-capacity stations (384 kilobytes per second (kbps)) and eight lower-capacity stations (32 kbps). Six European donor countries (Austria, Belgium, Norway, Spain, Switzerland and the United Kingdom) were to assign to the European Space Agency (ESA) responsibility for the management oversight of the design and development of the Mercure system. The investment required to develop and implement the Mercure systems was estimated by ESA at approximately $16,000,000, these costs to be met by donations from Governments. The operating concept called for UNEP to fund the ongoing operations of Mercure, including the lease through INTELSAT of satellite transponder capacity in both the Atlantic Ocean Region (AOR) and Indian Ocean Region (IOR), and the contracting of satellite-network monitoring and control through the Mercure hub station in Leuk, Switzerland, with the Swiss telecommunication authority (PTT). Operations of other earth stations were to be funded by the host country concerned.

4. At its seventeenth session, in May 1993, the Governing Council instructed the Executive Director to continue to negotiate, and, ultimately to reach an agreement with ESA for the acceptance of the donation (Governing Council decision 17/38). UNEP continued work on the definition and cost-analysis of the proposed system and, in November 1994, the Executive Director of UNEP signed the agreement with the Director General of ESA for the design and production of the system. This action was carried out in consultation with the Department of Administration and Management and the Office of Legal Affairs of the United Nations, both of which provided written authorization for UNEP to accept the offer. The Mercure donation was accepted as a contribution to the Environment Fund of UNEP and approved by the General Assembly in its endorsement of the report of the Governing Council on its eighteenth session (including Governing Council decision 18/47).

5. A system-wide satellite telecommunications system, then known as "the United Nations Backbone", was also being defined at that time for implementation by the United Nations Electronic Services Division (ESD). Accordingly, UNEP sought to coordinate the design of Mercure with the design

of the United Nations Backbone so as to avoid duplication. The UNEP policy, as stated in the agreement signed with ESA, specifically notes that UNEP fully intends to integrate Mercure into the United Nations system as soon as is technically practicable.

6. The United Nations Backbone telecommunications system was conceived as primarily a voice service, while the UNEP Mercure system was dedicated primarily to data services. Hence, a decision was taken in 1995 to begin the independent implementation of Mercure and to continue to evaluate opportunities for integration of the two services. Two specific actions were taken by UNEP to maintain the possibility of future integration. First, the satellite transponder capacity required for Mercure was to be included in the United Nations leases and/or planned leases, pending assured availability. Secondly, the host-country agreements for Mercure required the host countries to commit themselves to utilizing the system in accordance with the international regulations regarding United Nations telecommunications systems.

7. The go-ahead to implement Mercure was approved in Governing Council decision 17/38 and implementation began in January 1995. A specific project was approved for 1995-1996, with a total budget of $1,117,000 from the Environment Fund reserve. At its eighteenth session, the Governing Council approved a budget of $1, 995,000 for the 1995-1996 biennium for the continuing implementation of Mercure. Since there was a programmatic as well as an administrative benefit to the Programme, the funds were to be allocated as $700,000 from the MASC budget and $1,295,000 from the programme budget. Expenditure up to 31 March 1997 is expected to be $1,080,000, with a budget of $700,000 required to complete the programme up to the end of 1997.

8. Subsequently, ESD having reached a decision in February 1996 not to implement the United Nations Backbone, UNEP approached ESD regarding the possibility of adding ESD services to the Mercure earth stations in Nairobi and to provide independent but coexistent services via the larger Mercure earth station there. The dialogue regarding coexistence between Mercure and the ESD services continued with ESD and, at a meeting on 12 September 1996, it was agreed that the Mercure antenna could be upgraded for a moderate one-time cost with a reduced ongoing satellite transponder cost to ESD. ESD is still evaluating this option.

B. Background to UNEPnet implementation

9. UNEP is aggressively pursuing the unique opportunity presented by the Mercure project to develop proactively the crucial information-services infrastructure needed to improve access to environmental data and expertise by those countries most in need. UNEPnet services are to provide a means by which developing countries can actively participate in, contribute to and benefit from the rapid transformation already occurring in the developed world in all forms of information management with the emergence of the global information infrastructure, the "information superhighways". UNEPnet and Mercure are to ensure that the global "right to communicate" is realized, at least in part, through this marriage of appropriate satellite technology and programmatic direction.

10. UNEP staff members have worked closely with GRID-Arendal and other centres of expertise to design UNEPnet in order to provide a dedicated, global environmental Internet service. It is to use Mercure and other telecommunications facilities to make environmental information products and services from UNEP and partner institutions globally accessible to Internet users via numerous UNEPnet service nodes in Asia, Africa, Europe and the Americas. UNEPnet will promote and ease the exchange of information and expertise between UNEP staff members and their peers in other institutions, while also supporting administrative correspondence and data exchange among UNEP headquarters, the UNEP regional and outposted offices and, possibly, United Nations Headquarters.

11. UNEPnet will, as a result of the dedicated capacity of Mercure, provide guaranteed delivery of and access to environmental data by ministries of the Environment and other participants, without the congestion of generic Internet. Similarly, Mercure provides the ability for UNEPnet to reach areas that are not currently served by the Internet or that receive only a limited but expensive level of service.

12. UNEPnet has been designed in conjunction with centres of expertise in the United States, Europe and Japan. UNEP has formed a series of programmatic relationships, directed at enhancing the global provision of environmental information through UNEP, between the information resources of the developed world and the information requirements of the developing countries. Key among these relationships are:

(a) Participation in the Group of Seven Environment and Natural Resource Management (G7/ENRM) "virtual library of environment information", a pilot project being undertaken within the Global Information Infrastructure Initiative to provide users with a coherent view of geographically dispersed data and information resources;

(b) Participation in the Committee for Earth Observing Satellites' (CEOS) Information Locator System (CILS) activity to provide UNEP with powerful yet flexible service points to environmental data and information, for uses both on and off the Internet; and

(c) Negotiation with the International Telecommunication Union (ITU) in response to its calls for the promotion of telecommunications in support of socio-economic development and environmental management.

These relationships have been forged and maintained, in part, through expert advisory groups, convened by UNEP to advise the Executive Director, comprising representatives of recognized areas of expertise in network-service provision, including the United States National Aeronautics and Space Administration (NASA), the United States National Oceanic and Atmospheric Administration (NOAA), the European Space Agency (ESA), the European Union's Joint Research Centre (Ispra, Italy), the German Space Agency (DARA/DLR) and the Japanese space agency (NASDA). Negotiations continue regarding the establishment and provision of a variety of environment-information products and services, particularly to the developing countries, via UNEPnet and Mercure.

C. Cost-benefit analysis of Mercure

13. Paragraph 6 of Governing Council decision 18/47 requests the Executive Director to ensure that a full review and cost-benefit analysis of the system and experience gained in its initial operation is carried out as soon as technically feasible. Due to the ongoing delay in the operationalization of the Mercure system, it has been impossible to date to engage in the necessary analysis. However, UNEP is surveying the host countries for which Mercure stations are being implemented in order to acquire information regarding the costs of comparable commercial services in those countries. In lieu of this analysis and in response to paragraph 7 of Governing Council decision 18/47, a full status report is set out below.

D. Status of the Mercure Project

14. Fourteen sites have been identified by UNEP regional directors for implementation within the original Mercure donation, namely, Subnetwork-A stations at Leuk, Geneva (Switzerland), Nairobi (Kenya), Bangkok (Thailand), Beijing (China), San José (Costa Rica) and Moscow (Russian Federation), and Subnetwork-B at Manama (Bahrain), La Paz (Bolivia), Havana (Cuba), Almaty (Kazakstan), Maputo (Mozambique), Kathmandu (Nepal), Niamey (Niger) and Hanoi (Vietnam). Draft host-country agreements have been reviewed in detail with the Governments concerned, and finalized in the cases of Costa Rica and China; all other Governments have forwarded letters of intent to proceed, while the agreements are being finalized by their ministries. The initial stations for Mercure operations are expected to be in service in November 1996, as opposed to the dates of 1 April 1996 for the AOR and 1 August 1996 for the IOR originally scheduled by ESA, due to difficulties in technical implementation.

15. The Subnetwork-A stations at Nairobi and Leuk are ready for operation; the stations at Bangkok and Beijing are in the final stages of construction and scheduled for hand-over in December 1996, while the San José station will follow in January 1997. The proposed Subnetwork-A station in Moscow awaits the finalization of arrangements and, due to climatic constraints, will not be commissioned prior to April 1997.

16. The Subnetwork-B station installation is complete at La Paz. The stations at Havana, Niamey and Maputo are on schedule for installation in November 1996. Bahrain and Hanoi will be ready in December 1996 and Almaty and Kathmandu are to follow in January 1997.

17. The Government of Norway has committed additional funds for the acquisition of an additional Subnetwork-A station to be installed in the UNEP collaborative centre at Arendal, Norway. This station is expected to be installed and operational by the end of December 1996.

18. The Government of Austria has supplied funds to ESA for the installation of a ninth Mercure Subnetwork-B station to serve the Central European Environmental Data Request Facility (CEDAR), co-funded by UNEP and the Government of Austria. This station has been installed.

19. Operations technical staff from most of the Mercure host countries were trained in Switzerland during September 1996. The staff members are paid by the individual host countries, in accordance with their agreements with UNEP. The training was sponsored by UNEP, within the context of the Mercure agreements and the UNEPnet programme, and covered aspects of both satellite ground-station operation and trouble-shooting and Internet-based local- and wide-area network operations and management.

20. Satellite transponder capacity for the IOR is currently leased from INTELSAT via ESD at a cost of $95,000 per annum, commencing 1 August 1996. Capacity for the AOR is leased on a special commercial lease from INTELSAT via ESD at $262,2000 per annum, commencing 1 April 1996, but is to be converted to a standard ESD lease as from 1 October 1997.

21. It is important to note that the overall technical capacity is currently in place to commence the Mercure service to countries, albeit at a level below maximum capacity prior to all stations being brought on-line. The primary reason for the present delay in bringing the Mercure system into operation lies in obtaining authorization to open communications via INTELSAT with the central and pivotal earth stations located at UNEP Headquarters, Gigiri, Nairobi. These earth stations were installed in April 1996, but remain inoperative to date. Negotiations between UNEP and the Government of Kenya commenced in earnest in May 1995, prior to the eighteenth session of the Governing Council. At that session, Governing Council decision 18/47 authorized the Executive Director of UNEP to proceed with the implementation of Mercure. Subsequent meetings with representatives of the Kenya Ministry of Foreign Affairs and the Kenya Post and Telecommunications Corporation (KPTC) led to an agreement in principle on 6 December 1995 to finalize the draft agreement. The combination of this agreement and the decision of the Governing Council led UNEP to ensure access to crucial but very scarce satellite capacity by committing itself to leasing of appropriate INTELSAT satellite capacity through ESD. The lease for the AOR was established to begin on 1 April 1996, and the lease for the IOR to begin on 1 August 1996. Those dates were selected in accordance with the implementation schedules for the delivery of the Mercure stations by ESA. The cost to UNEP of the AOR satellite access, through a special commercial lease from INTELSAT via ESD commencing 1 April 1996, is $262,200 per annum and is to be converted to a standard ESD lease at lower cost on 1 October 1997. The cost of IOR satellite access, through a standard United Nations rate from INTELSAT via ESD, is $95,000 per annum commencing 1 August 1996. UNEP is liable for $206,000 up to the end of November 1996 and, by 1 February 1997, will have spent $263,000.

22. It is now apparent that the primary cause of delay in commencing Mercure operations lies in the fact that the documentation required by INTELSAT for certification of earth stations, which was provided to the Kenyan signatory to INTELSAT (KPTC) in March 1996 for submission to INTELSAT as a prerequisite for the final check-out and initiation of Mercure operations, has not been forwarded by the Government of Kenya. After several formal representations had been made by senior UNEP officials, UNEP was informed that additional consultations within the Government of Kenya would be required. A further response was received from the Permanent Representative of Kenya on 4 November 1996 which stated, in part, that:

"As you are aware, both Kenya Government and UNEP officials held a series of meetings some time back. It was agreed that the Government was to do consultations amongst its various Departments and these consultations are still taking place and we will revert back to you as soon as they are concluded".

To date, submission of the documentation to INTELSAT has not yet been authorized by the Government of Kenya. As a result, the Mercure earth stations in Nairobi cannot begin operation.

E. Mercure Project cost projections 1998-1999

23. Paragraph 5 of the ACABQ report of 12 May 1995 and paragraph 8 of Governing Council decision 18/47 both recommend that UNEP should examine the possibility that, in subsequent bienniums, the costs for the implementation, management and maintenance of the Mercure system might be covered and presented under the management and administrative support costs (MASC) budget rather than under the programme budget. However, internal consultations have concluded that Mercure constitutes an environmental programme in itself. Given the reform of the MASC budget in response to Governing Council decision 18/41, the delivery of UNEPnet and the provision of additional environmental information services under the Mercure system are functions that can be more clearly ascribed to the Environment Programme.

24. Costs for ongoing operations of Mercure and UNEPnet in 1998-1999 are based on the continued requirement for services contracted from INTELSAT and the Swiss PTT for two years, for the provision of resources to ensure reliable operations as required in the Mercure agreement, for the implementation of pilot activities to demonstrate the benefit of the infrastructure in the context of the Environment Programme, and for initiatives to extend the reach of the network to additional countries as called for in Governing Council decision 18/47, paragraph 5.

25. INTELSAT transponder capacity in AOR and IOR is expected to cost $400,000 per biennium, provided that UNEP can, in 1997, reduce the cost for the current commercial AOR transponder capacity to that of a standard United Nations lease. Contracted support from the Swiss PTT for satellite-network monitoring and management will continue to be required during the 1998-1999 biennium, at the current charge of $220,000 per annum. In addition, UNEP Internet monitoring, management and service assurance oversight on a 24-hour global basis will have to be contracted to one of the existing Internet-providing organizations, at an estimated charge of $100,000 per annum.

26. By the start of the 1998-1999 biennium, the Mercure components will have been in operation for almost a year out of a two-year warranty period on hardware and consequently, during the 1998-1999 biennium, UNEP will become responsible for the provision of the necessary replacement parts. This is estimated to cost $160,000 in one year only.

27. Operations of UNEPnet and Mercure are estimated to require services of 3.5 full-time professional staff equivalents, at a projected cost of $935,200 per biennium, plus their associated support and administration services (one secretary, office space, communications charges, etc.). These staff members have also to coordinate the implementation of pilot activities to promote and demonstrate the utility and benefit of UNEPnet/Mercure in partnership with external collaborating partners - for which $100,000 per annum is estimated as required support and implementation costs - and also to promote the

extension of UNEPnet/Mercure to additional countries. A projected associated budget for travel of $400,000 per biennium is based on experience to date in the implementation and operation of these networks together with the liaison and coordination of the pilot utilization activities.

F. Budgetary strategy for UNEPnet/Mercure in the 1998-1999 biennium

28. In formulating the overall budgetary strategy for 1998-1999, UNEP is evaluating programmatic scope under a variety of options regarding the level of programme funding, namely, levels of $130 million, $105 million, and $80 million. For purposes of comparison, the budget for the 1994-1995 biennium - i.e. when Mercure was approved - was $120m. If the budget expectation for 1998-1999 is $80 million, UNEP will have to seek extrabudgetary, collaborative arrangements with potential partners for the operation, maintenance, and exploitation of UNEPnet/Mercure. If the Governing Council were to determine that a budgetary level of $105m should be planned by UNEP, it would include the full budgetary commitment to UNEPnet/Mercure operations. Projects to demonstrate the utility of the UNEPnet/Mercure system would be implemented through other components of the Environment Programme and/or external collaborators.

29. GRID-Arendal has been a major collaborating partner with UNEP in its environment assessment activities and has been the primary source of engineering and system design for UNEPnet and Mercure. UNEP has been pursuing approaches with that organization to achieve some additional collaborative funding for the assured continuation of Mercure. One concept that seems to offer some merit would be to form a co-funded project for the operation, expansion, and utilization of Mercure, for instance, at GRID-Arendal as a UNEP function and global service. The approach would be to have UNEP provide a level of funding and staff and to seek donations from interested participants to achieve the required level of resources.

30. On the assumption that there will be a positive commitment from at least one potential donor country as a counterpart contribution, UNEP is submitting a budget for UNEPnet/Mercure operations to the Council at a level of $1,400,000 for the biennium.

G. Possible Further Uses of UNEPnet/Mercure and Collaborative Activities with the UN agencies

31. Two significant potential collaborative activities between UNEP and other United Nations organizations are under discussion. First, UNEP has initiated discussions with UNDP regarding service through UNEPnet/Mercure to the resident representatives of UNDP where this could be provided. The existing Memorandum of Understanding between UNDP and UNEP is to be expanded to include the desire that, where practicable and economically viable, UNDP would utilize the UNEPnet/Mercure services on a cost-sharing basis. Secondly, a recent exchange of correspondence with ITU has strengthened a relationship between UNEP and ITU regarding specific future initiatives in respect of telecommunications and the environment and the ITU programme called the global "right to communicate" with its special emphasis on the social and developmental requirements of the developing world.